

### M.5.3.9 Plutonium Conversion

Studies of evaluation basis accidents and beyond evaluation basis accidents have been performed for a Pu conversion facility in the *Data Report for Plutonium Conversion Facility*. The studies postulated a set of accident scenarios that were representative of the risks and consequences for workers and the public that can be expected in the facility were constructed and operated. Although not all potential accidents were addressed, those that were postulated have consequences and risks that are expected to envelop the consequences and risks of an operating facility. In this manner, no other credible accidents with an expected frequency of occurrence larger than  $1.0 \times 10^{-7}$  per year are anticipated that will have consequences and risks larger than those described in this section.

#### M.5.3.9.1 Accident Scenarios and Source Terms

A wide range of hazardous conditions and potential accidents were identified as candidates to represent the risks to workers and the public of operating the facility. Through a screening process, four evaluation basis accidents and four beyond evaluation basis accidents were selected for further definition and analysis. Descriptive information on these accidents is provided in Tables M.5.3.9.1–1 and M.5.3.9.1–2. Accidents source term information is provided in Tables M.5.3.9.1–3 through M.5.3.9.1–5. Descriptions of accident scenarios are provided in Table M.5.3.9.1–6.

**Table M.5.3.9.1–1. Evaluation Basis Accident Scenarios for the Plutonium Conversion Facility**

Accident Scenario	Accident Frequency (per year)	Source Term at Risk	Source Term Released to Environment
Fire on the loading dock	$1.0 \times 10^{-4}$ to $1.0 \times 10^{-3}$	18 g Pu	$0.8 \text{ g Pu}$
Fire in a process cell	$1.0 \times 10^{-5}$ to $1.0 \times 10^{-3}$	24 g Pu	$4.8 \times 10^{-6} \text{ g Pu}$
Deflagration inside a glovebox	$1.0 \times 10^{-5}$ to $1.0 \times 10^{-3}$	10 kg Pu	$1.0 \times 10^{-3} \text{ g Pu}$
Forklift breach of containment	$4.5 \times 10^{-5}$	4 kg PuO <sub>2</sub>	$1.7 \times 10^{-9} \text{ g Pu}$

Source: LANL 1996c.

**Table M.5.3.9.1–2. Beyond Evaluation Basis Accident Scenarios for the Plutonium Conversion Facility**

Accident Scenario	Accident Frequency (per year)	Source Term at Risk	Source Term Released to Environment
Nuclear criticality	$< 1.0 \times 10^{-7}$	$5.0 \times 10^{17}$ fissions; gaseous by-products released	a
Beyond design basis fire in a process cell	$< 1.0 \times 10^{-7}$	24 g Pu	$0.034 \text{ g Pu}$
Oxyacetylene explosion in a process cell	$< 1.0 \times 10^{-7}$	10 kg Pu	$50 \text{ g Pu}$
Beyond evaluation basis earthquake	$< 1.0 \times 10^{-7}$	10 kg Pu	$25 \text{ g Pu}$

<sup>a</sup> See Table M.5.3.9.1–3.

Source: LANL 1996c.

**Table M.5.3.9.1-3. Plutonium Conversion Facility Criticality Source Terms**

Nuclide	Produced (Ci)	Released (Ci)
Kr-83m	5.5	2.75
Kr-85m	3.55	1.75
Kr-85	4.05x10 <sup>-4</sup>	2.0x10 <sup>-4</sup>
Kr-87	21.5	11
Kr-88	11.5	6
Kr-89	650	325
Xe-131m	5.0x10 <sup>-3</sup>	2.5x10 <sup>-3</sup>
Xe-133m	0.11	0.05
Xe-133	1.35	0.75
Xe-135m	165	85
Xe-135	20.5	10
Xe-137	2,450	1,225
Xe-138	550	275
I-131	0.55	0.025
I-132	60	3
I-133	8	0.4
I-134	215	11
I-135	22.5	1.0

Source: LANL 1996c.

**Table M.5.3.9.1-4. Plutonium Conversion Facility Evaluation Basis  
Source Terms**

Accident Parameter	Accident Scenario			
	Fire on Loading Dock	Fire in Process Cell	Deflagration Inside a Glovebox	Forklift Breach of Containment
Frequency of occurrence (per year)	5.0x10 <sup>-4</sup> a	1.0x10 <sup>-4</sup> a	1.0x10 <sup>-4</sup> a	4.5x10 <sup>-5</sup>
Pu released to environment (g)	0.8	4.8x10 <sup>-6</sup>	1.0x10 <sup>-3</sup>	1.7x10 <sup>-9</sup>
Isotope Released to Environment (Ci)				
Pu-238	2.9x10 <sup>-3</sup>	1.74x10 <sup>-8</sup>	3.62x10 <sup>-6</sup>	6.15x10 <sup>-12</sup>
Pu-239	0.0448	2.69x10 <sup>-7</sup>	5.60x10 <sup>-5</sup>	9.57x10 <sup>-11</sup>
Pu-240	0.0147	8.83x10 <sup>-8</sup>	1.84x10 <sup>-5</sup>	3.13x10 <sup>-11</sup>
Pu-241	0.0606	3.63x10 <sup>-7</sup>	7.57x10 <sup>-5</sup>	1.29x10 <sup>-10</sup>
Pu-242	4.75x10 <sup>-6</sup>	2.85x10 <sup>-11</sup>	5.94x10 <sup>-9</sup>	1.01x10 <sup>-14</sup>
Am-241	3.19x10 <sup>-4</sup>	1.92x10 <sup>-9</sup>	3.99x10 <sup>-7</sup>	6.78x10 <sup>-13</sup>

<sup>a</sup> Midpoint of the estimated frequency range.

Source: Derived from Table M.5.1.3.4-3 and M.5.3.9.1-1.

**Table M.5.3.9.1-5. Plutonium Conversion Facility Beyond Evaluation Basis Accident Source Terms**

Accident Parameter	Nuclear Criticality	Accident Scenario		
		Beyond Evaluation Basis	Fire in Process Cell	Oxyacetylene Explosion in Process Cell
Frequency of occurrence (per year)	1.0x10 <sup>-7</sup>	1.0x10 <sup>-7</sup>	1.0x10 <sup>-7</sup>	1.0x10 <sup>-7</sup>
Pu released to environment (g)	NA	0.034	50	25
Fissions	5.0x10 <sup>17</sup>	NA	NA	NA
<b>Isotope Released to Environment (Ci)</b>				
Pu-238	0	1.23x10 <sup>-4</sup>	0.181	0.0905
Pu-239	0	1.90x10 <sup>-3</sup>	2.80	1.40
Pu-240	0	6.26x10 <sup>-4</sup>	0.920	0.460
Pu-241	0	2.57x10 <sup>-3</sup>	3.79	1.89
Pu-242	0	2.02x10 <sup>-7</sup>	2.97x10 <sup>-4</sup>	1.49x10 <sup>-4</sup>
Am-241	0	1.36x10 <sup>-5</sup>	0.02	9.98x10 <sup>-3</sup>
Kr-83m	2.75	0	0	0
Kr-85m	1.75	0	0	0
Kr-85	2.0x10 <sup>-4</sup>	0	0	0
Kr-87	11	0	0	0
Kr-88	6	0	0	0
Kr-89	325	0	0	0
Xe-131m	2.5x10 <sup>-3</sup>	0	0	0
Xe-133m	0.05	0	0	0
Xe-133	0.75	0	0	0
Xe-135m	85	0	0	0
Xe-135	10	0	0	0
Xe-137	1,225	0	0	0
Xe-138	275	0	0	0
I-131	0.025	0	0	0
I-132	3	0	0	0
I-133	0.4	0	0	0
I-134	11	0	0	0
I-135	1.0	0	0	0

Note: NA=not applicable.

Source: Derived from Tables M.5.1.3.4-3, M.5.3.9.1-2, and M.5.3.9.1-3.

**Table M.5.3.9.1-6. Accident Scenario Descriptions for the Plutonium Conversion Facility**

<b>Accident Scenario</b>	<b>Accident Description</b>
<b>Evaluation Basis Accidents</b>	
Fire on the loading dock	The fire is caused by welding, cleaning solvents, electrical shorts, or other miscellaneous causes. The scenario assumes an open garage door and that a single drum of combustible waste is involved in the fire.
Fire in the process cell	It is assumed that a process cell contains a glovebox used for final processing of Pu oxide powder. The gloves, stowed outside the glovebox, are coated with a layer of Pu dust. A flammable cleaning liquid such as acetone or isopropyl alcohol is brought into the process cell in violation of operating procedures, spills and ignites. The initial extent and intensity of the fire are sufficient to completely incinerate the gloves. The sprinkler system activates and protects the glovebox from further damage. The ventilation system with HEPA filters continues to function throughout the accident.
Deflagration inside a glovebox	The bounding evaluation basis explosion is a deflagration of a flammable gas mixture inside a glovebox. It is assumed that through some unforeseen set of failures, a combustible gas mixture accumulates inside a glovebox and is ignited, possibly by an electrical spark from an operating electrical device. The deflagration blows out the HEPA filter from the glovebox ventilation system exit. Gloves may also be blown out. The room volumes are sufficient to attenuate the pressure wave to levels below that needed to damage the building ventilation system HEPA filters.
Forklift breach of containment	The most catastrophic case of leak or spill or nuclear material would result from a forklift or other large vehicle running over a package or nuclear material, breaching the containment, and causing an airborne release to the room. Three-stage HEPA filtration is available for the facility exhaust to limit the release to the environment.
<b>Beyond Evaluation Basis Accidents</b>	
Nuclear criticality	There will not be sufficient quantities of Pu solutions at the facility to cause a criticality accident. The most likely cause of a criticality event involving Pu oxides would be improper stacking or handling of bulk nuclear material. Multiple operational errors in the material spacing, packing density, manner and type of containment, and maximum quantities of fissile materials permitted in the area would be required for the postulated criticality accident to occur.
Beyond evaluation basis fire in a process cell	A typical fire with coincident failures of two or more major safety systems constitutes a beyond evaluation basis fire. The evaluation postulated the fire in a process cell, discussed above, with the sprinkler system and ventilation system with HEPA filtration inoperative during the accident.
Oxyacetylene explosion in a process cell	The evaluation postulated the explosion of a welding rig oxyacetylene bottle in a process cell. The explosion is sufficient to blow out the HEPA filters and cause significant damage to the ventilation system and nearby equipment.
Beyond evaluation basis earthquake	The following assumptions were used in the evaluation: (1) the earthquake disables the ventilation system; (2) there is significant structural damage to the building but it does not totally collapse; (3) a ceiling slab falls on the glovebox; (4) the process cell with the most material at risk is located on an outside wall; (5) the outside wall cracks; and (6) the wind is blowing and the cracks are located in the lee side of the building.

Source: LANL 1996c.

**M.5.3.9.2      *Accident Impacts***

The estimated impacts of the postulated accidents at each site are provided in the Tables M.5.3.9.2–1 through M.5.3.9.2–6. The dose and cancer fatality estimates are based on the analysis of the accident source terms in Tables M.5.3.9.1–4 and M.5.3.9.1–5 using the MACCS computer code. [Text deleted.]

**Table M.5.3.9.2-1. Plutonium Conversion Facility Accident Consequences at Hanford Site**

Accident Scenario	Worker at 1,000 m		Maximum Offsite Individual		Population to 80 km	
	Dose (rem)	Probability of Cancer Fatality <sup>a</sup>	Dose (rem)	Probability of Cancer Fatality <sup>a</sup>	Cancer Fatalities <sup>b</sup>	Accident Frequency (per year)
Fire on the loading dock	0.24	9.7x10 <sup>-5</sup>	7.7x10 <sup>-3</sup>	3.8x10 <sup>-6</sup>	14.0	7.0x10 <sup>-3</sup>
Fire in a process cell	1.4x10 <sup>-6</sup>	5.8x10 <sup>-10</sup>	4.6x10 <sup>-8</sup>	2.3x10 <sup>-11</sup>	8.4x10 <sup>-5</sup>	4.2x10 <sup>-8</sup>
Deflagration inside a glovebox	3.0x10 <sup>-4</sup>	1.2x10 <sup>-7</sup>	9.6x10 <sup>-6</sup>	4.8x10 <sup>-9</sup>	0.018	8.7x10 <sup>6</sup>
Forklift breach of containment	5.1x10 <sup>-10</sup>	2.0x10 <sup>-13</sup>	1.6x10 <sup>-11</sup>	8.2x10 <sup>-15</sup>	3.0x10 <sup>-8</sup>	1.5x10 <sup>-11</sup>
Nuclear criticality	5.2x10 <sup>-4</sup>	2.1x10 <sup>-7</sup>	1.7x10 <sup>-5</sup>	8.4x10 <sup>-9</sup>	3.4x10 <sup>-3</sup>	1.7x10 <sup>-6</sup>
Beyond evaluation basis fire in a process cell	0.010	4.1x10 <sup>-6</sup>	3.3x10 <sup>-4</sup>	1.6x10 <sup>-7</sup>	0.59	3.0x10 <sup>-4</sup>
Oxyacetylene explosion in a process cell	15.0	6.8x10 <sup>-3</sup>	0.48	2.4x10 <sup>-4</sup>	873	0.44
Beyond evaluation basis earthquake	7.5	3.1x10 <sup>-3</sup>	0.24	1.2x10 <sup>-4</sup>	436	0.22
[Text deleted.]						1.0x10 <sup>-7</sup>

<sup>a</sup> Increased likelihood (or probability) of cancer fatality to a hypothetical individual (a single onsite worker at a distance of 1,000 m or the site boundary, whichever is smaller, or to a hypothetical individual in the offsite population located at the site boundary) if exposed to the indicated dose. The value assumes the accident has occurred.

<sup>b</sup> Estimated number of cancer fatalities in the entire offsite population out to a distance of 80 km if exposed to the indicated dose. The value assumes the accident has occurred.

Note: All values are mean values.

Source: Calculated using the source terms in Tables M.5.3.9.1-4 and M.5.3.9.1-5 and the MACCS computer code.

**Table M.5.3.9-2-2. Plutonium Conversion Facility Accident Impacts at Nevada Test Site**

Accident Scenario	Worker at 1,000 m		Maximum Offsite Individual		Population to 80 km	
	Dose (rem)	Probability of Cancer Fatality <sup>a</sup>	Dose (rem)	Probability of Cancer Fatality <sup>a</sup>	Dose (person·rem)	Number of Cancer Fatalities <sup>b</sup>
Fire on the loading dock	0.16	6.6x10 <sup>-5</sup>	3.0x10 <sup>-3</sup>	1.5x10 <sup>-6</sup>	0.32	1.6x10 <sup>-4</sup>
Fire in a process cell	9.9x10 <sup>-7</sup>	4.0x10 <sup>-10</sup>	1.8x10 <sup>-8</sup>	9.1x10 <sup>-12</sup>	1.9x10 <sup>-6</sup>	9.5x10 <sup>-10</sup>
Deflagration inside a glovebox	2.1x10 <sup>-4</sup>	8.2x10 <sup>-8</sup>	3.8x10 <sup>-6</sup>	1.9x10 <sup>-9</sup>	4.0x10 <sup>-4</sup>	2.0x10 <sup>-7</sup>
Forklift breach of containment	3.5x10 <sup>-10</sup>	1.4x10 <sup>-13</sup>	6.4x10 <sup>-12</sup>	3.2x10 <sup>-15</sup>	6.7x10 <sup>-10</sup>	3.4x10 <sup>-13</sup>
Nuclear criticality	3.9x10 <sup>-4</sup>	1.5x10 <sup>-7</sup>	6.5x10 <sup>-6</sup>	3.2x10 <sup>-9</sup>	6.6x10 <sup>-5</sup>	3.3x10 <sup>-8</sup>
Beyond evaluation basis fire in a process cell	7.0x10 <sup>-3</sup>	2.8x10 <sup>-6</sup>	1.3x10 <sup>-4</sup>	6.4x10 <sup>-8</sup>	0.013	6.7x10 <sup>-6</sup>
Oxyacetylene explosion in a process cell	10.3	4.5x10 <sup>-3</sup>	0.19	9.4x10 <sup>-5</sup>	19.8	9.9x10 <sup>-3</sup>
Beyond evaluation basis earthquake [Text deleted.]	5.1	2.1x10 <sup>-3</sup>	0.094	4.7x10 <sup>-5</sup>	9.9	4.9x10 <sup>-3</sup>
						1.0x10 <sup>-7</sup>

<sup>a</sup> Increased likelihood (or probability) of cancer fatality to a hypothetical individual (a single onsite worker at a distance of 1,000 m or the site boundary, whichever is smaller, or to a hypothetical individual in the offsite population located at the site boundary) if exposed to the indicated dose. The value assumes the accident has occurred.

<sup>b</sup> Estimated number of cancer fatalities in the entire offsite population out to a distance of 80 km if exposed to the indicated dose. The value assumes the accident has occurred.

Note: All values are mean values.

Source: Calculated using the source terms in Tables M.5.3.9-1-4 and M.5.3.9-1-5 and the MACCS computer code.

**Table M.5.3.9.2-3. Plutonium Conversion Facility Accident Impacts at Idaho National Engineering Laboratory**

Accident Scenario	Worker at 1,000 m		Maximum Offsite Individual		Population to 80 km	
	Dose (rem)	Probability of Cancer Fatality <sup>a</sup> (rem)	Dose (rem)	Probability of Cancer Fatality <sup>a</sup> (rem)	Dose (person·rem)	Number of Cancer Fatalities <sup>b</sup>
Fire on the loading dock	0.22	9.0x10 <sup>-5</sup>	1.9x10 <sup>-3</sup>	9.7x10 <sup>-7</sup>	4.2	2.1x10 <sup>-3</sup>
Fire in a process cell	1.3x10 <sup>-6</sup>	5.4x10 <sup>-10</sup>	1.2x10 <sup>-8</sup>	5.8x10 <sup>-12</sup>	2.5x10 <sup>-5</sup>	1.3x10 <sup>-8</sup>
Deflagration inside a glovebox	2.8x10 <sup>-4</sup>	1.1x10 <sup>-7</sup>	2.4x10 <sup>-6</sup>	1.2x10 <sup>-9</sup>	5.2x10 <sup>-3</sup>	2.6x10 <sup>-6</sup>
Forklift breach of containment	4.8x10 <sup>-10</sup>	1.9x10 <sup>-13</sup>	4.1x10 <sup>-12</sup>	2.1x10 <sup>-15</sup>	8.9x10 <sup>-9</sup>	4.5x10 <sup>-12</sup>
Nuclear criticality	5.0x10 <sup>-4</sup>	2.0x10 <sup>-7</sup>	3.9x10 <sup>-6</sup>	1.9x10 <sup>-9</sup>	8.5x10 <sup>-4</sup>	4.3x10 <sup>-7</sup>
Beyond evaluation basis fire in a process cell	9.5x10 <sup>-3</sup>	3.8x10 <sup>-6</sup>	8.3x10 <sup>-5</sup>	4.1x10 <sup>-8</sup>	0.18	8.9x10 <sup>-5</sup>
Oxyacetylene explosion in a process cell	14.1	6.9x10 <sup>-3</sup>	0.12	6.1x10 <sup>-5</sup>	262	0.13
Beyond evaluation basis earthquake [Text deleted.]	7.0	2.8x10 <sup>-3</sup>	0.061	3.0x10 <sup>-5</sup>	131	0.065
						1.0x10 <sup>-7</sup>

<sup>a</sup> Increased likelihood (or probability) of cancer fatality to a hypothetical individual (a single onsite worker at a distance of 1,000 m or the site boundary, whichever is smaller, or to a hypothetical individual in the offsite population located at the site boundary) if exposed to the indicated dose. The value assumes the accident has occurred.

<sup>b</sup> Estimated number of cancer fatalities in the entire offsite population out to a distance of 80 km if exposed to the indicated dose. The value assumes the accident has occurred.

Note: All values are mean values.

Source: Calculated using the source terms in Tables M.5.3.9.1-4 and M.5.3.9.1-5 and the MACCS computer code.

**Table M.5.3.9.2-4. Plutonium Conversion Facility Accident Impacts at Pantex Plant**

Accident Scenario	Worker at 1,000 m		Maximum Offsite Individual		Population to 80 km	
	Dose (rem)	Probability of Cancer Fatality <sup>a</sup>	Dose (rem)	Probability of Cancer Fatality <sup>a</sup>	Dose (person-rem)	Number of Cancer Fatalities <sup>b</sup>
Fire on the loading dock	0.097	3.9x10 <sup>-5</sup>	0.031	1.5x10 <sup>-5</sup>	4.8	2.4x10 <sup>-3</sup>
Fire in a process cell	5.8x10 <sup>-7</sup>	2.3x10 <sup>-10</sup>	1.9x10 <sup>-7</sup>	9.3x10 <sup>-11</sup>	2.8x10 <sup>-5</sup>	1.4x10 <sup>-8</sup>
Deflagration inside a glovebox	1.2x10 <sup>-4</sup>	4.8x10 <sup>-8</sup>	3.9x10 <sup>-5</sup>	1.9x10 <sup>-8</sup>	5.9x10 <sup>-3</sup>	3.0x10 <sup>-6</sup>
Forklift breach of containment	2.1x10 <sup>-10</sup>	8.2x10 <sup>-14</sup>	6.6x10 <sup>-11</sup>	3.3x10 <sup>-14</sup>	1.0x10 <sup>-8</sup>	5.1x10 <sup>-12</sup>
Nuclear criticality	2.4x10 <sup>-4</sup>	9.7x10 <sup>-8</sup>	9.3x10 <sup>-5</sup>	4.6x10 <sup>-8</sup>	2.3x10 <sup>-3</sup>	1.1x10 <sup>-6</sup>
Beyond evaluation basis fire in a process cell	4.1x10 <sup>-3</sup>	1.6x10 <sup>-6</sup>	1.3x10 <sup>-3</sup>	6.6x10 <sup>-7</sup>	0.20	1.0x10 <sup>-4</sup>
Oxyacetylene explosion in a process cell	6.1	2.5x10 <sup>-3</sup>	1.9	9.7x10 <sup>-4</sup>	297	0.15
Beyond evaluation basis earthquake [Text deleted.]	3.0	1.2x10 <sup>-3</sup>	0.97	4.8x10 <sup>-4</sup>	149	0.074
						1.0x10 <sup>-7</sup>

<sup>a</sup> Increased likelihood (or probability) of cancer fatality to a hypothetical individual (a single onsite worker at a distance of 1,000 m or the site boundary, whichever is smaller, or to a hypothetical individual in the offsite population located at the site boundary) if exposed to the indicated dose. The value assumes the accident has occurred.

<sup>b</sup> Estimated number of cancer fatalities in the entire offsite population out to a distance of 80 km if exposed to the indicated dose. The value assumes the accident has occurred.

Note: All values are mean values.

Source: Calculated using the source terms in Tables M.5.3.9.1-4 and M.5.3.9.1-5 and the MACCS computer code.

**Table M.5.3.9.2-5. Plutonium Conversion Facility Accident Impacts at Oak Ridge Reservation**

Accident Scenario	Worker at 772 m		Maximum Offsite Individual		Population to 80 km	
	Dose (rem)	Probability of Cancer Fatality <sup>a</sup>	Dose (rem)	Probability of Cancer Fatality <sup>a</sup>	Dose (person-rem)	Number of Cancer Fatalities <sup>b</sup>
Fire on the loading dock	0.28	1.1x10 <sup>-4</sup>	0.28	1.4x10 <sup>-4</sup>	52.3	0.026
Fire in a process cell	1.7x10 <sup>-6</sup>	6.8x10 <sup>-10</sup>	1.7x10 <sup>-6</sup>	8.4x10 <sup>-10</sup>	3.1x10 <sup>-4</sup>	5.0x10 <sup>-4</sup>
Deflagration inside a glovebox	3.5x10 <sup>-4</sup>	1.4x10 <sup>-7</sup>	3.5x10 <sup>-4</sup>	1.8x10 <sup>-7</sup>	0.065	1.0x10 <sup>-4</sup>
Forklift breach of containment	6.0x10 <sup>-10</sup>	2.4x10 <sup>-13</sup>	6.0x10 <sup>-10</sup>	3.0x10 <sup>-13</sup>	1.1x10 <sup>-7</sup>	3.3x10 <sup>-5</sup>
Nuclear criticality	5.9x10 <sup>-4</sup>	2.4x10 <sup>-7</sup>	5.9x10 <sup>-4</sup>	3.0x10 <sup>-7</sup>	0.035	5.6x10 <sup>-11</sup>
Beyond evaluation basis fire in a process cell	0.012	4.8x10 <sup>-6</sup>	0.012	6.0x10 <sup>-6</sup>	2.2	4.5x10 <sup>-5</sup>
Oxyacetylene explosion in a process cell	17.6	7.9x10 <sup>-3</sup>	17.6	9.8x10 <sup>-3</sup>	3,270	1.8x10 <sup>-5</sup>
Beyond evaluation basis earthquake [Text deleted.]	8.8	3.5x10 <sup>-3</sup>	8.8	4.4x10 <sup>-3</sup>	1,630	1.0x10 <sup>-7</sup>

<sup>a</sup> Increased likelihood (or probability) of cancer fatality to a hypothetical individual (a single onsite worker at a distance of 1,000 m or the site boundary (772 m for this facility at ORR), whichever is smaller, or to a hypothetical individual in the offsite population located at the site boundary) if exposed to the indicated dose. The value assumes the accident has occurred.

<sup>b</sup> Estimated number of cancer fatalities in the entire offsite population out to a distance of 80 km if exposed to the indicated dose. The value assumes the accident has occurred.

Note: All values are mean values.

Source: Calculated using the source terms in Tables M.5.3.9.1-4 and M.5.3.9.1-5 and the MACCS computer code.

**Table M.5.3.9.2-6. Plutonium Conversion Facility Accident Impacts at Savannah River Site**

Accident Scenario	Worker at 1,000 m		Maximum Offsite Individual		Population to 80 km	
	Dose (rem)	Probability of Cancer Fatality <sup>a</sup>	Dose (rem)	Probability Cancer Fatality <sup>a</sup>	Dose (person·rem)	Cancer Fatalities <sup>b</sup>
Fire on the loading dock	0.16	6.3x10 <sup>-5</sup>	3.1x10 <sup>-3</sup>	1.5x10 <sup>-6</sup>	15.0	7.5x10 <sup>-3</sup>
Fire in a process cell	9.4x10 <sup>-7</sup>	3.8x10 <sup>-10</sup>	1.9x10 <sup>-8</sup>	9.3x10 <sup>-10</sup>	9.0x10 <sup>-5</sup>	4.5x10 <sup>-8</sup>
Deflagration inside a glovebox	2.0x10 <sup>-4</sup>	7.9x10 <sup>-6</sup>	3.9x10 <sup>-6</sup>	1.9x10 <sup>-9</sup>	0.019	9.4x10 <sup>-6</sup>
Forklift breach of containment	3.3x10 <sup>-10</sup>	1.3x10 <sup>-13</sup>	6.6x10 <sup>-12</sup>	3.3x10 <sup>-15</sup>	3.2x10 <sup>-8</sup>	1.6x10 <sup>-11</sup>
Nuclear criticality	3.5x10 <sup>-4</sup>	1.4x10 <sup>-7</sup>	5.7x10 <sup>-6</sup>	2.8x10 <sup>-9</sup>	4.6x10 <sup>-3</sup>	2.3x10 <sup>-6</sup>
Beyond evaluation basis fire in a process cell	6.7x10 <sup>-3</sup>	2.7x10 <sup>-6</sup>	1.3x10 <sup>-4</sup>	6.6x10 <sup>-8</sup>	0.64	3.2x10 <sup>-4</sup>
Oxyacetylene explosion in a process cell	9.9	4.4x10 <sup>-3</sup>	0.19	9.7x10 <sup>-5</sup>	936	0.47
Beyond evaluation basis earthquake	4.9	2.1x10 <sup>-3</sup>	0.097	4.8x10 <sup>-5</sup>	468	0.23
[Text deleted.]						1.0x10 <sup>-7</sup>

<sup>a</sup> Increased likelihood (or probability) of cancer fatality to a hypothetical individual (a single onsite worker at a distance of 1,000 m or the site boundary, whichever is smaller, or to a hypothetical individual in the offsite population located at the site boundary) if exposed to the indicated dose. The value assumes the accident has occurred.

<sup>b</sup> Estimated number of cancer fatalities in the entire offsite population out to a distance of 80 km if exposed to the indicated dose. The value assumes the accident has occurred.

Note: All values are mean values.

Source: Calculated using the source terms in Tables M.5.3.9.1-4 and M.5.3.9.1-5 and the MACCS computer code.